Company Name:	SI Group Inc. – Orangeburg Facility	**Permit Writer:**	Diane Humphries
Permit Number:	1860-0004-DV	**Date:**	DRAFT

ORAORDATE APPLICATION RECEIVED: May 29, 2015

FACILITY DESCRIPTION
SI Group is a specialty chemical manufacturing facility located in Orangeburg that has been in operation since 1937. This facility manufactures fuel additives, pharmaceutical intermediates, antioxidants, agricultural intermediates, lubricant additives, aluminum alkyls, orthoalkylation chemicals, and flame retardants.

PROJECT DESCRIPTION
This project is for the installation of a new boiler. It will ultimately replace the need to use steam from the two wood-fired units at Council Energy. The boiler will combust natural gas. Distillate fuel oil will be used as a backup, but only during periods of natural gas curtailment, gas supply interruptions of any duration, maintenance, and testing per the definition of *unit designed to burn gas 1 subcategory* in 40 CFR 63.7575. The boiler is rated at 62 MM Btu/hr when combusting natural gas and 60 MM Btu/hr when combusting fuel oil. The sulfur content by weight of the fuel oil used will be limited to 0.5%. Emissions from the boiler will be limited to less than 40 TPY of SO_2 for PSD avoidance.

Application Inconsistencies (This is only a partial list – not all items were documented.)

1. Vendor guarantee – application stated that it was included in the application, but it was not. This was discussed during a telephone conversation between the facility and the Bureau on June 4, 2015 and followed up in an email from the Bureau to the facility on June 17, 2015. A guaranteed NO_x emission letter was emailed to the Bureau on June 17, 2015 (see details in comments of regulation review for standard 5.2).
2. The application requested different equipment IDs for each fuel being combusted by the boiler. This was brought up to the facility during the June 4, 2015 telephone conversation. The facility verified that they only want one equipment ID for the boiler both during the June 4 call and via email on June 17, 2015.
3. The application requested a separate construction and operating permit for this project. Based on the June 4, 2015 telephone call and verified by June 17, 2015 email, the facility will get a construction permit for this boiler (1860-0004-DV) which will ultimately be incorporated into their Title V operating permit (TV-1860-0004).
4. Regulatory review - Form 2570 states applicable (yes) for regulation 61-62.1, section II(E) Synthetic Minor Construction Permits with a comment of *With this project, the facility is not requesting any synthetic minor permit limits*. The columns for listing specific limitations and/or requirements and demonstrating compliance were left blank. No synthetic minor limits were requested in the application.
5. Emissions
    a. Lead emissions were not provided for fuel oil combustion with the initial application. They were requested via email on June 17 with a due date of July 1. They were requested again on July 2 with a due date of July 8. Provided via email on July 2, 2015.
    b. In the initial application, SO_2 increases from this project are shown as 0.16 TPY on page 1 of 2 of DHEC form 2569. In appendix B, SO_2 emissions when the boiler is combusting natural gas are 0.16 TPY and 1.91E-03 when combusting no. 2 fuel oil (% sulfur in fuel oil not provided). In the Cleaver Brooks boiler expected emissions data, SO_x emissions at 100% firing rate are 0.16 TPY when combusting natural gas and 124.972 TPY when combusting #2 oil using 0.5% sulfur content. Clarification on the SO_2 emissions was requested by the Bureau via email on June 18, 2015. A response was received via email on July 1, 2015 which verified that the facility will utilize 15 ppm sulfur (0.0015%) and updated potential emissions were submitted which changed the SO_2 emissions for no. 2 fuel oil to 0.41 TPY. On July 7, 2015, the facility requested that the permit provide the flexibility to burn fuel with sulfur content of 0.5% by weight. Using the vendor supplied SO_x emission factor, the potential SO_2 emissions will be 125 TPY. Based on an email from the facility sent on July 13, 2015, the facility has elected to take a federally enforceable limit of less than 40 TPY for SO_2 to avoid PSD.
6. Modeling
    a. Modeling was provided for CO, but CO emissions are less than 10 lb/hr.
    b. Based on emissions submitted July 1, PM_{10} and $PM_{2.5}$ emissions are greater than 1 lb/hr but modeling was not provided. On July 23, an email was received that PM, PM_{10}, and $PM_{2.5}$ emission estimated in the original submission were based on vendor data, which assumes PM is PM_{10} and all $PM_{2.5}$. Alternative PM_{10} and $PM_{2.5}$ emissions estimates based on AP-42 were provided in this email, with PM_{10} estimated at 0.74 lb/hr and $PM_{2.5}$ estimated at 0.18 lb/hr.

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COLLOCATION DETERMINATION

The Bureau of Air Quality (BAQ) determined that the SI Group facility is co-located with Council Energy, Inc. (TV-1860-0072) for the purposes of Title III, PSD, Title V, and LAER. This determination was made on February 18, 2004, after review of co-location information from both facilities. According to the determination, the two sources should be considered "one source" for Title V, PSD, and Title III. The two facilities each have their own separate Air Source Identification numbers and Title V operating permits. However, the emissions from both sources shall be considered together when determining construction projects, modifications, etc. Additionally, the major source threshold for the "one source" for PSD purposes shall now be 100 TPY; for Title V purposes, the threshold is 100 TPY of any criteria pollutant, and 10 TPY for any single HAP and 25 TPY for combined HAP for the "one source." It should be noted that the plan is that this new boiler will replace the need for the boilers at Council Energy.

SPECIAL CONDITIONS, MONITORING, LIMITS

Per facility request, the boiler is being restricted to less than 40 TPY of SO_2 for PSD avoidance and the sulfur content by weight of the oil used is being limited to 0.5%.

EMISSIONS

PROJECT EMISSIONS (in TPY)			
Pollutant	**NG (62 MMBtu/hr)**	**#2 FUEL OIL (60 MMBtu/hr)**	**Worst Case Emissions**
PM	2.02	6.29 (based on vendor data)	6.29
PM_{10}	2.02	6.29 (based on vendor data)	6.29
$PM_{2.5}$	2.02	6.29 (based on vendor data)	6.29
SO_2	0.16	124.972 (based on vendor data)	124.972, but being limited to 40 TPY with the synthetic minor limit being established with this permit
NO_x	9.502 (based on vendor data)	29.886 (based on vendor data)	29.886
VOC	1.46	0.38	1.46
CO	22.36	9.53	22.36
Lead	1.33E-4	0.0024	0.0024

For additional detail on project emissions, see application received May 29, 2015 as well as emails received during the drafting of this construction permit.

OPERATING PERMIT STATUS

This is a Title V facility. The current Title V was issued May 31, 2001 and expired June 30, 2004. A timely Title V renewal application was received. This construction permit will be incorporated into the Title V operating permit with a minor modification.

REGULATORY APPLICABILITY REVIEW

Regulation	**Comments/Periodic Monitoring Requirements**
Section II.E - Synthetic Minor	(Applicable) This construction permit will establish a less than 40 TPY of SO_2 for PSD avoidance.
Standard No. 1	(Applicable) The boiler will be subject to a 20% opacity limit, 0.6 lb PM/million Btu input, and 2.3 lb SO_2 /million Btu input.
Standard No. 3 (state only)	(Not Applicable) This boiler will only combust virgin fuel.
Standard No. 5.2	(Applicable) The boiler is subject to this standard. As a natural-gas fired boiler ≥10 MMBtu/hr and < 100 MMBtu/hr, it is required to have low-NO_x Burners or equivalent technology capable of achieving 30 parts per million by volume (ppmv) at 3 percent O_2 Dry Basis (0.036 lb/MMBtu) and as a distillate oil fired boiler ≥10 MMBtu/hr and < 100 MMBtu/hr, it is required to have low-NO_x Burners or equivalent technology capable of achieving 0.15 lb/MMBtu for #2 fuel oil. A vendor guarantee was not provided in the application. An unsigned vendor guarantee was provided by the facility on June 17, 2015 which stated that the boiler (Cleaver Brooks packaged boiler Model CBEX Elite-200-1500-200ST) will meet NO_x limit of 30 ppmvd corrected at 3% oxygen and meet NOx limit of 90 ppmvd corrected at 3% oxygen with fuel bound nitrogen content of 0.015% by

Regulation	Comments/Periodic Monitoring Requirements
	weight. Per the facility, Cleaver Brooks has indicated that a vendor guarantee will have to go through their Legal Department and has requested that the BAQ permit engineer call the Cleaver-Brooks contact on the unsigned letter or accept NO_x measurements via a portable analyzer at startup of the boiler. On June 18, 2015, the BAQ permit engineer spoke with L.C. Banks (Firetube Applications Engineer) from Cleaver Brooks (the boiler manufacturer) who verified that the Cleaver-Brooks boiler expected emission data sheets for natural gas and #2 oil located in Appendix B of the construction permit application were provided by Cleaver Brooks. A tune-up plan is to be developed. Tune-ups shall be performed every two years in accordance with manufacturer's specs or good engineering practices.
Standard No. 7	(Not applicable) As this is a chemical process plant, it is a 100 TPY source. The facility is considered a major PSD source and each project should be evaluated for PSD applicability. The significant emission increase threshold for SO_2 is 40 TPY. The potential SO_2 emissions while combusting #2 fuel oil with sulfur of 0.5% by weight is 124.972 TPY. The facility is electing to take a less than 40 TPY SO_2 limit for this boiler for PSD avoidance.
61-62.6	(Not Applicable) This project does not have fugitive PM.
40 CFR 60 and 61-62.60	(Applicable) This project will be subject to Subparts A (General Provisions) and Dc (Standards Of Performance For Small Industrial-Commercial-Institutional Steam Generating Units). When combusting fuel oil, the boiler will be limited to fuel oil with sulfur content not greater than 0.5 weight % sulfur. Fuel supplier certifications and fuel usage will be required. Opacity limits will be 20/27%.
40 CFR 61 and 61-62.61	(Applicable) The facility is subject to Subpart M (National Emission Standards for Asbestos).
40 CFR 63 and 61-62.63	(Applicable) This facility is a major source of HAP. This project will be subject to Subparts A (General Provisions) and DDDDD (National Emission Standards For Hazardous Air Pollutants For Major Sources: Industrial, Commercial, and Institutional Boilers And Process Heaters). The facility has stated that the unit is part of the Gas 1 subcategory per Subpart DDDDD. It will only burn liquid fuels as allowed by this subpart.

AMBIENT AIR STANDARDS REVIEW

Regulation	Comments/Periodic Monitoring Requirements
Standard No. 2	This facility has demonstrated compliance with this standard; see air compliance analysis summary sheet dated August 21, 2015. Due to the limitations on the use of fuel oil, only natural gas emissions were used to determine compliance with this standard.
Standard No. 7.c	This facility has demonstrated compliance with this standard; see air compliance analysis summary sheet dated August 21, 2015. Due to the limitations on the use of fuel oil, only natural gas emissions were used to determine compliance with this standard.
Standard No. 8 (state only)	The only toxic air pollutant emissions from this project are from the combustion of virgin fuel, so standard 8 was not updated.

PUBLIC NOTICE

This construction permit will undergo a 30-day public notice period to establish synthetic minor limits in accordance with SC Regulation 61-62.1, Section II(N). This permit was placed on the SC DHEC Public Notice website on September 1, 2015. The comment period was open from September 1, 2015 to September 30, 2015.

SUMMARY AND CONCLUSIONS

It has been determined that this source, if operated in accordance with the submitted application, will meet all applicable requirements and emission standards.